

## Geographic differentiation of the *miyosii*-group of *Cybaeus* (Araneae: Cybaeidae) in western Japan, with descriptions of two new species.

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**Abstract** — Four known species, *Cybaeus miyosii* Yaginuma 1941, *C. okafujii* Yaginuma 1963, *C. kumaensis* Irie & Ono 2001 and *C. hibaensis* Ihara 1994, and two new species, *C. kunisakiensis* and *C. tsurugi* are described as the *miyosii*-group in the genus *Cybaeus* (Cybaeidae). These six species are small to medium in size and pale in color compared to other species of each of the local species assemblages. The *miyosii*-group is distributed over western Japan, corresponding to the Chugoku district (western Honshu), Shikoku and Kyushu. Each species of the group occupies a fragment within an overall geographic range of the group. Since these six species show close similarities in external morphology and they are parapatric in their distribution, they can be recognized as a single superspecies.

**Key words** — Cybaeidae, *Cybaeus miyosii*-group, geographic differentiation, parapatric distribution, *Cybaeus kunisakiensis* n. sp., *Cybaeus tsurugi* n. sp., description

I have been involved in a faunal survey and analyses of geographic differentiation of the genus *Cybaeus* in western Honshu and adjacent areas, Japan. Each of the local species assemblages of the genus *Cybaeus* in western Honshu consists of several species. For example, in western part of Hiroshima Prefecture, westernmost Honshu, the assemblage is comprised of 5 species: *C. nipponicus*, *C. akiensis*, *C. kuramotoi*, *C. okafujii* and *C. hiroshimaensis*, in decreasing order of body size. They are morphologically and biologically distinct species, which are clearly diverged in both body size and genital morphology (Ihara 2003). On the other hand, each species of the assemblage often constitutes a closely related species group together with other similar-sized species which are allopatrically or parapatrically distributed one another. I have already described five species (*C. hiroshimaensis* etc.) as new, all of them are smallest-sized in each of the assemblages (Ihara 1993).

In this paper, I deal with six small- to medium-sized species of the genus *Cybaeus*, in which *C. okafujii* is included, from western Honshu, Shikoku and Kyushu. Since these six species show close similarities in external morphology and they are parapatric in their distribution, they can be recognized as a single superspecies, which is designated here as the *miyosii*-group. The purpose of the present paper is to summarize geographic variation of the *miyosii*-group and to present descriptions of two new species.

### Materials and Methods

#### Morphological examinations

All the measurements were made for the specimens immersed in 80% ethanol under a stereo dissecting microscope with an ocular micrometer. Female genitalia removed from the abdomen were cleared in hot 10% KOH and 3% H<sub>2</sub>O<sub>2</sub> according to the method described in Komatsu & Yaginuma (1968) to observe internal sclerotized structure.

The type specimens designated in this paper and voucher specimens are deposited in the National Science Museum (Natural History), Tokyo. Other specimens are in my personal collection. Data of those specimens will be given by the following order: Locality, number of individuals, date collected, and name of the collector. Abbreviations used: NT = Nobuo Tsurusaki, MI = Megumi Ihara, YI = Yoh Ihara.

#### Recognition of species

When two closely related forms are completely allopatric, it is difficult to judge objectively whether they should be treated as two distinct species or two geographical races of a single species. There are no species that exhibits a geographical overlap with adjacent forms within the *miyosii*-group, species delimitation within the group is an open question. However, in this study, I treat a series of geographical forms as distinct species on the basis of presence of distinct morphological gaps in genital morphology substantially serve to separate one form from other adjacent

forms.

### The *miyosii*-group of the genus *Cybaeus*

#### Species included

6 species: *Cybaeus miyosii* Yaginuma 1941, *C. okafujii* Yaginuma 1963, *C. kumaensis* Irie & Ono 2001, *C. hibaensis* Ihara 1994, *C. kunisakiensis* n. sp., and *C. tsurugi* n. sp.

#### Geographic distribution

This *miyosii*-group is distributed over western Japan, corresponding to the Chugoku district (western Honshu), Shikoku and Kyushu (Fig. 1). Each species of the group occupies a fragment within an overall geographic range of the group. It gives essentially a parapatric pattern to the distribution, although there are no overlap zones between the distributional ranges of any two species of the group.

#### Diagnostic characters

Species belonging to this group are small to medium in size and pale in color compared to other species of *Cybaeus* sympatrically found. Due to the similarity in external morphology, diagnosis of each species relies primarily upon

genital morphology of both sexes. In male, principal differences are in the shapes of patellar apophysis and apical part of conductor. In females, their epigyna closely resemble each other in appearance. However, they are distinguishable each other by shape of opening or internal structure seen through the integument.

#### General feature of the group

The general feature of the species belonging to this group is as follows.

Head region narrow, and lower than thoracic region. Anterior eye row straight or slightly procurved as seen from front, posterior eye row almost straight or slightly recurved as seen from above. Anterior median eyes the smallest. Ocular area about twice as wide as long. Clypeus shorter than median ocular area. Chelicera geniculate in front, promargin of fang furrow with 3 teeth (median one the largest), retromargin with 3 teeth and several denticles, and basally with lateral condyle. Sternum longer than wide, anterior margin undulate. Labium wider than long. Length of legs: 4>1>2>3. Tibia I with 2-2-2-2 ventral spines and 2 prolateral spines; metatarsus I with 2-2-2 ventral spines, 1 prolateral spine and 1 retrolateral spine; tibia II with 2-2-

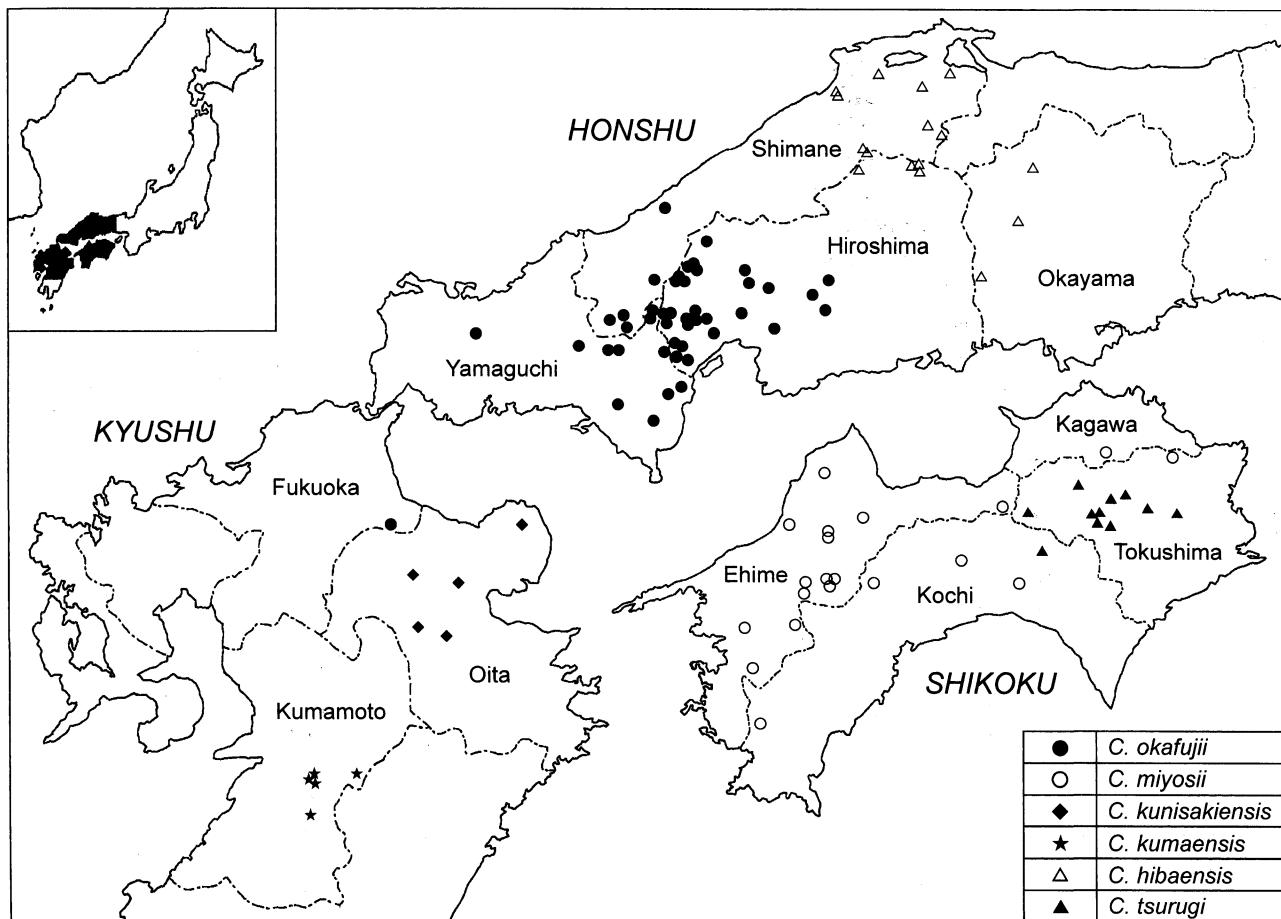


Fig. 1. Distribution of the *miyosii*-group of the genus *Cybaeus* in west Japan.

1(retromargin)-2 ventral spines and 2 or 3 prolateral spines; metatarsus II 2-2-3 ventral spines, some prolateral spines and 1 retrolateral spine. Abdomen oval, with only simple setae. Colulus two groups of some setae.

Palp. Relatively thick and short in proportion. Cymbium relatively short, tibia shorter than patella. Patella retrolaterally with thumb-like apophysis, with conical teeth. Genital bulb circle, and relatively large.

Coloration (Figs. 2, 4). Carapace light yellow to bright yellowish brown, head region darker than thoracic region. Chelicerae, maxillae, labium and sternum bright yellowish brown to yellowish brown; chelicerae darker than the others. Legs light yellow to bright yellowish brown without annulations, occasionally with faint annulations. Abdomen pale yellow without markings or dorsally dark grayish yellow with pale yellow chevron pattern.

Female. Similar to male in coloration. Carapace, thoracic region more slender, head region wider. Abdomen larger and more rounded. Legs shorter than those of male.

Genitalia. Epigynum simple, only flat epigynal plate, posteriorly with an opening. Spermathecae 3 pairs, spherical or oval.

### Descriptions of species

#### *Cybaeus miyosii* Yaginuma 1941

[Japanese name: Hime-namihagumo]  
(Figs. 6, 13-16, 27-30, 39, 49-50)

*Cybaeus miyosii* Yaginuma 1941, p. 128, figs. 1-5. (Female holotype from Nametoko, Ehime Pref., Shikoku, Japan, collected by Yasunori Miyosi, 23-XI-1940, preserved in Laboratory of Biology, Ohtemen Gakuin University, examined)

This species was originally described from Nametoko Valley in southern Ehime Prefecture, Shikoku by only three female specimens. Here I present description of male of this species on the basis of a specimen newly collected from the type locality.

*Description.* Male (specimen from Nametoko Valley). Measurements (in mm). Body length 4.00; carapace length 2.18, width 1.60, head region width 0.90; abdomen length 2.04, width 1.36; sternum length 1.10, width 1.01. Length of legs (femur / patella / tibia / metatarsus / tarsus; total): Leg I: 1.77/0.69/1.64/1.48/1.02; 6.60. Leg II: 1.71/0.65/1.41/1.40/0.93; 6.10. Leg III: 1.54/0.62/1.18/1.39/0.79; 5.52. Leg IV: 1.90/0.65/1.69/1.97/0.98; 7.19. Ocular area: length 0.28, width 0.59.

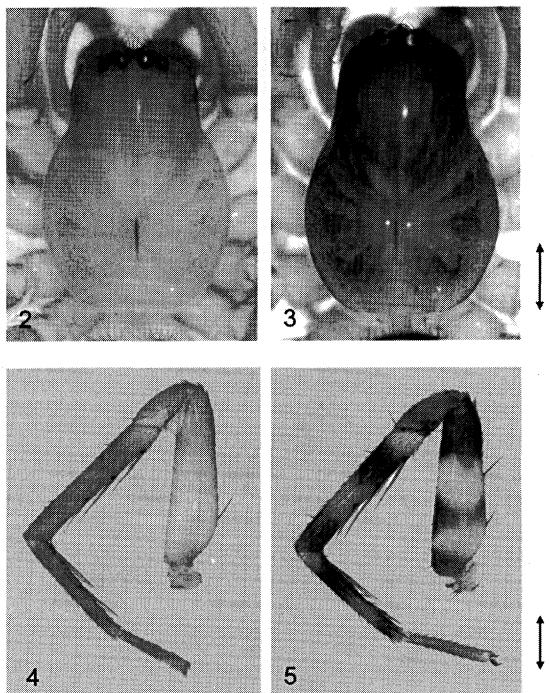
Anterior eye row slightly procurved as seen from front, posterior eye row almost straight as seen from above. Diameter of eyes: anterior median eyes < posterior median eyes = posterior lateral eyes < anterior lateral eyes; anterior median eyes 1/3 to anterior lateral eyes. Chelicera, retromargin with 3 teeth and 4 denticles. Metatarsus of second leg with 4 (left) or 3 (right) prolateral spines. Colulus two groups of 3 setae.

Palp (Figs. 6, 27-28, 39, 49-50). Patellar apophysis triangle, with 12 conical teeth.

Coloration. Carapace bright yellowish brown, head region darker than thoracic region. Chelicerae, maxillae, labium and sternum yellowish brown; chelicerae darker than the others. Legs bright yellowish brown without annulations. Abdomen dorsally dark grayish yellow with pale yellow chevron pattern.

*Voucher specimen.* Nametoko-keikoku Valley near the type locality, Matsuno-chō, Kita-uwa-gun, Ehime Pref., Japan: 1♂, 9-X-1993, Y. Ihara leg.

*Other specimens examined.* TOKUSHIMA PREF. Itano-gun, Donari-chō, Miyagawauchi: 1♀, 11-XI-1996, YI; 5♂3♀, 12-XI-1996, YI. KAGAWA PREF. Kagawa-gun, Shionoe-chō, Asagihara, 1♂2♀, 1-XI-1989, YI. EHIME PREF. Uma-gun, Shingū-mura, Mt. Tochio, 1♂, 22-XI-1994, NT. Shūsō-gun, Tanbara-chō, Kurase, Iwane Shrine, 1♀, 23-IV-2000, NT. Hōjōshi, Mt. Takanawa: 1♀, 1-I-1993, NT; 2♂4♀, 4-IV-1994, NT. Iyo-shi, Mt. Tagami Hōju-ji temple, 1♀, 3-V-1994, NT. Kamiukena-gun, Kuma-chō, Mt. Saragamine: 1♀, 2-V-1971, NT; 1♀, 6-V-1996, YI. Yanadani-mura: Mt. Kasatori-yama, 1♀, 24-IV-1993, YI; Nishidani, 1♂, 24-IV-1993, YI; Mt.



Figs. 2-5. Coloration pattern of carapace and leg I of *Cybaeus okafujii* and *C. kuramotoi* from same locality (Jakuji-kyō Gorge, Yamaguchi Pref.). 2, 4 *C. okafujii*; 3, 5 *C. kuramotoi*. — 2, 3 Female carapace; 4,5 Female leg I, retrolateral view. (Scale: 0.5 mm).

Ôkawamine, 1♂4♀, 5-XI-1993, NT; Mt. Godanjô, 1♀, 4-V-1997, YI. Oda-chô: Odamiyama Gorge, 2♂1♀, 5-IV-1994, NT; 2♀, 23-XI-1994, NT; Odamiyama, Masagoya, 1♀, 2-V-1994, NT. Higashi-uwa-gun: Uwa-chô, Akanma, Chigeo-daini-dô Cave, 1♀, 2-V-1967, Tetsuo Kawasawa, in Yaginuma's collection; Shirokawa-chô, Kurosegawa-dô Cave, 3♀, 8-XI-1971, T. Kawasawa, in Yaginuma's collection. KOCHI PREF. Sukumo-shi, Hashigami-chô, Sakamoto, 1♀, 17-XI-1995, Koichi Nojima. Kami-gun, Kahoku-chô, 1♂, 19-XI-2000, YI. Tosa-gun, Tosa-chô, Higashi-ishihara, 3♂1♀, 3-XI-2001, YI. Agawa-gun, Agawa-mura, Nakatsu Valley, 1♀, 23-XI-2002, YI.

**Variation.** Shape of patellal apophysis of male palp slightly varies among populations (cf. Figs. 27–28 with 29–30). Female genitalia also vary among them (cf. Figs. 13–14 with 15–16).

It seems that carapace length as the body size tends to be reduced toward the north in the range of distribution (Fig. 43).

**Distribution.** Ehime Pref., Kochi Pref., Kagawa Pref. and northern part of Tokushima Pref., Shikoku, Japan (Fig. 1).

**Remarks.** Refer to the "Remarks" in *C. okafujii*. Male palp of this species also resembles that of *C. tsurugi* in the shape of cymbium and patellal apophysis (cf. Figs. 6, 27–28 with 11, 37–38). However, this species can be distinguished from *C. tsurugi* by the shape and length of tibia (cf. Figs.

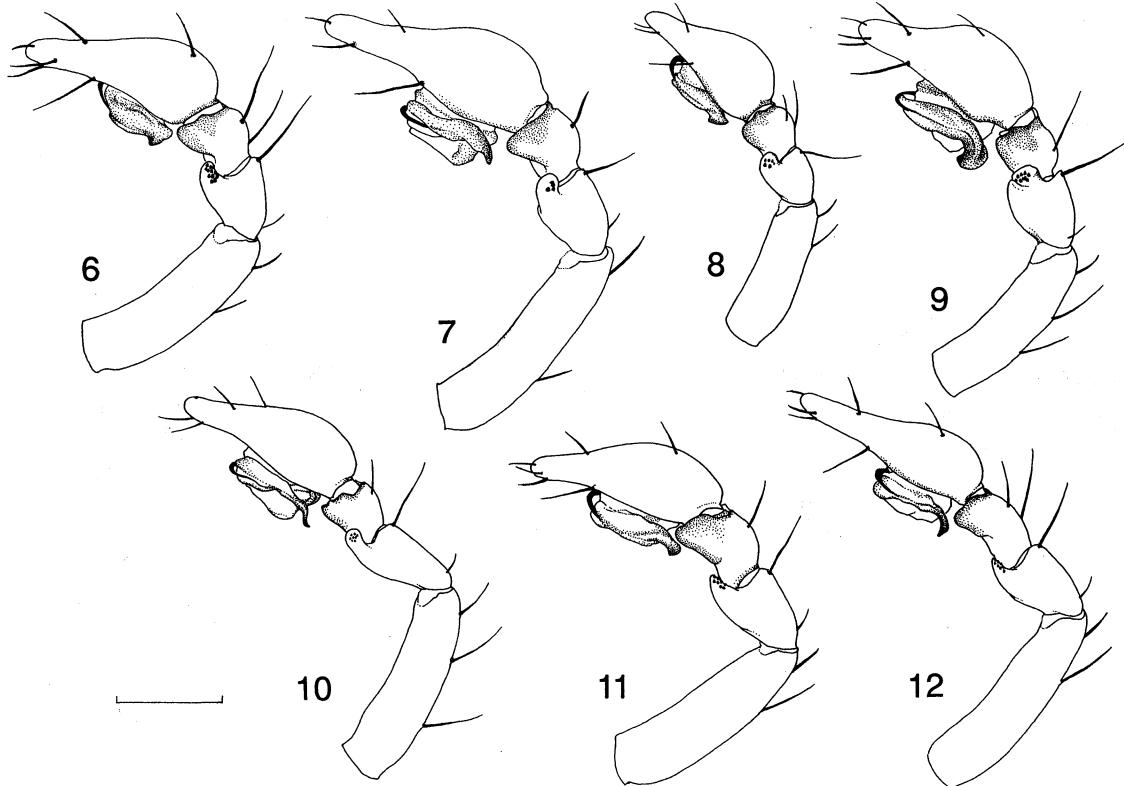
49–50 with 51–52).

*Cybaeus okafujii* Yaginuma 1963  
[Japanese name: Akiyoshi-namihagumo]  
(Figs. 7, 17–18, 31–32)

*Cybaeus okafujii* Yaginuma 1963, p. 58, figs e–f (female holotype from Shûhô-do (= Akiyoshi-dô) cave, 22-IX-1952, collected by Shun-ichi Uéno, preserved in Ohtemon Gakuin University, missing?, not examined; a male paratype from Maguraji-no-anan cave, 5-VIII-1962, by Goro Okafuji, preserved in laboratory of biology, Ohtemon Gakuin University, examined); Ihara 2003, p. 52, figs. 4, 8.

**Description.** See Yaginuma (1963).

**Specimens examined.** YAMAGUCHI PREF. Iwakuni-shi, Shiroyama, 2♂1♀, 15-X-1990, YI. Kuga-gun, Kuga-chô, Kinmeiji Pass, 1♂4♀, 30-X-1992, YI. Shûtô-chô, Nakayama, 2♀, 30-X-1992, YI. Nishiki-chô: Kitani-kyô Gorge, 2♂1♀, 23-X-1994, MI; Usagô, 6♀, 6-XI-1994, YI; Jakuji-kyô Gorge, 2♂3♀, 20-X-2002, YI. Miwa-chô, Oze-gawa Reservoir, 1♂, 23-XI-1988, YI. Kumage-gun, Kumage-chô, Hara, 1♀, 2-XI-1991, YI. Tsuno-gun, Kano-chô, Mt. Nagano, 1♀, 23-X-1994, YI. Saba-gun, Tokuji-chô, Mt. Takahachi-yama, 1♀, 2-XI-1990, YI. HIROSHIMA PREF. Hiroshima-shi, Higashi-ku, Fukuda, 1♀, 28-I-1989, YI. Asaminami-ku, Tomo, 2♀, 5-XI-1992, YI. Asakita-ku: Asa-chô, Ogauchi, 1♀, 2-X-1994, YI; Nabara-kyô



**Figs. 6–12.** Male palp (left), retrolateral view: 6 *Cybaeus miyosii* (near the type locality); 7 *C. okafujii* (paratype); 8 *C. kumaensis* (Izumi-mura, Kumamoto Pref.); 9 *C. hibaensis* (holotype); 10 *C. kunisakiensis* n. sp. (holotype); 11 *C. tsurugi* n. sp. (holotype); 12 *C. sp.* (Tosa-chô, Kochi Pref.). (Scale: 0.5 mm.)

Gorge, 3♀, 7-I-1990, YI. Ōtake-shi, Kuba-chō, 2♂, 25-X-1989, YI. Kuritani-chō: Yokotaki, 1♀, 28-II-1990, YI; 2♀, 10-IV-1990, YI; 1♂1♀, 9-X-1990, YI; Mt. Mikura-dake, 2♂9♀, 7-X-1992, YI; Ushirobara, 1♂, 7-X-1992, YI. Hatsukaichi-shi, Mt. Gokurakuji: 1♀, 12-XI-1988, YI; 1♂1♀, 3-V-1991, YI; 1♀, 28-IX-1991, YI. Saiki-chō: Hariyama, 1♂, 1-XI-1988, YI; 1♀, 15-IX-1989, YI; Kuji-mura, Nakamura, 1♀, 23-XI-1988, YI; Kami-kawakami, 2♀, 24-IX-2001, MI; Shimo-kawakami, 1♀, 24-IX-2001, YI; Mushidō, 1♀, 12-IX-1993, YI; 2♂4♀, 3-XI-1993, YI; Hanagami, 3♂4♀, 3-XI-1993; Iiyama, 1♀, 3-XI-1993, YI; 2♀, 20-X-2002, YI. Yoshiwa: Jippō-rindō forest road, 2♀, 20-IX-2001, YI; 1♂, 30-X-2002, YI; Seto-daki Falls, 1♀, 11-IX-2002, YI. Saeki-gun, Yuki-chō, Higashiyama-keikoku, 1♀, 21-I-1990, YI. Yamagata-gun, Kake-chō, Sakae, 1♀, 18-III-1990, YI; 2♂, 22-IX-1990, YI. Togōchi-chō: Ushigoya-kōgen, Campsite, 1♀, 15-IX-1995, YI; Yokogō, 1♀, 16-IX-1995, YI; Yoshiwagō, 5♀, 27-IX-1998, YI & MI. Geihoku-chō, Mt. Garyū, 1♀, 24-IX-1990, YI. Takata-gun, Mukaihara-chō: Saka, Nakagumi, 5♂2♀, 16-XII-1990, YI; Aridome, 1♂, 24-X-1998, MI. Kamo-gun, Fukutomi-chō, Kamitono, 1♀, 12-XI-2000, YI. SHIMANE PREF. Naka-gun, Misumi-chō, Ino, Ichiba, 1♂, 26-X-1993, YI. Mino-gun, Hikimi-chō, Shiso, 1♂1♀, 18-X-2002, YI. Kanoashi-gun, Muikaichi-machi: Mt. Mottagadake, 1♀, 10-XII-1989, K. Nojima, 1♀, 10-XII-1989, YI; Tachigōchi, 1♂, 2-X-1991, YI, 1♀, 31-I-1992, YI; Kōji, 2♂1♀, 31-I-1992, YI; Tachido, 2♂4♀, 26-X-1997, YI & MI. FUKUOKA PREF. Buzen-shi, 1♂, 19-XI-1994, YI.

**Variation.** No prominent variation was found in the morphology of male palp and female genitalia both within and among populations. However, male palpi of eastern populations which are distributed Hiroshima Prefectur are slightly smaller compared with that of paratype from eastern part of its renge.

**Distribution.** Western part of Hiroshima Pref., western part of Shimane Pref. and Yamaguchi Pref., western Honshu, and Fukuoka Pref., northern Kyushu, Japan (Fig. 1).

**Remarks.** This species closely resembles *C. miyosii* even in the genital organs which are principal diagnostic characters in this genus. Although they are clearly distinguishable by genital morphology, the difference between them is modest. However, distributions of *C. okafujii* and *C. miyosii* are completely separated by the Seto Inland Sea, which is located between Honshu and Shikoku. This means that we would have no chance to test specific status of them by finding sympatric occurrence or intergradation zone between the two forms. I treat here *C. okafujii* as distinct species from *C. miyosii*, although there remains some doubt about the specific status of *C. okafujii*.

*Cybaeus kumaensis* Irie & Ono 2001  
[Japanese name: Kuma-namihagumo]  
(Figs. 8, 19-20, 33-34, 40)

*Cybaeus kumaensis* Irie & Ono 2001, p. 206, figs. 1-10 (male holotype from Itagi, Itsuki-mura, Kuma-gun, Kumamoto Pref., Kyushu, Japan, 26-X-2000, T. Irie leg. NSMT-Ar 4781,

not examined)

**Description.** See Irie & Ono (2001).

**Specimens examined.** KUMAMOTO PREF. Shimomashiki-gun, Tomochi-machi, Kashiwagawa, 1♀, 16-X-2001, YI. Kamimashiki-gun, Seiwa-son, Midorikawa-keikoku, 1♀, 19-II-1990, YI. Yatsushiro-gun, Izumi-mura: Hagi, 5♀, 28-III-2001, YI; Kureko, 2♂2♀, 15-X-2001, YI; Taniuchi, 1♂, 15-X-2001, YI.

**Variation.** No prominent variation was found in the morphology among the populations, probably due partly to its narrow range of distribution.

**Distribution.** Kumamoto Prefecture, central Kyushu, Japan (Fig. 1).

**Remarks.** This species tends to be slightly smaller than other species belonging to the *miyosii*-group (Fig. 44). Carapace length ranges 1.78-1.85 mm (n=3) in male and 1.47-1.85 mm (mean 1.64, n=9) in female. It may be because a dwarf species corresponding to the smallest-sized group of the Chugoku district is absent in central Kyushu.

*Cybaeus hibaensis* Ihara 1994  
[Japanese name: Hiba-namihagumo]  
(Figs. 9, 23-24, 45-48)

*Cybaeus hibaensis* Ihara 1994, p. 87, figs. 1-9. (holotype: male, Mt. Tate-eboshi, Saijo-chō, Hiba-gun, Hiroshima Pref., 31-XII-1989, Yoh Ihara leg., examined)

**Description.** See Ihara (1994).

**Specimens examined.** SHIMANE PREF. Iishi-gun, Tonbara-cho, Mt. Ōyorogi, 1♀, 13-IX-1998, YI. Hikawa-gun, Koryō-chō, Hatamura, 1♀, 27-IX-2001, YI. Other specimens are listed in Ihara (1994).

**Variation.** Shape of patellar apophysis of male palp considerably varies among populations (Figs 45-48).

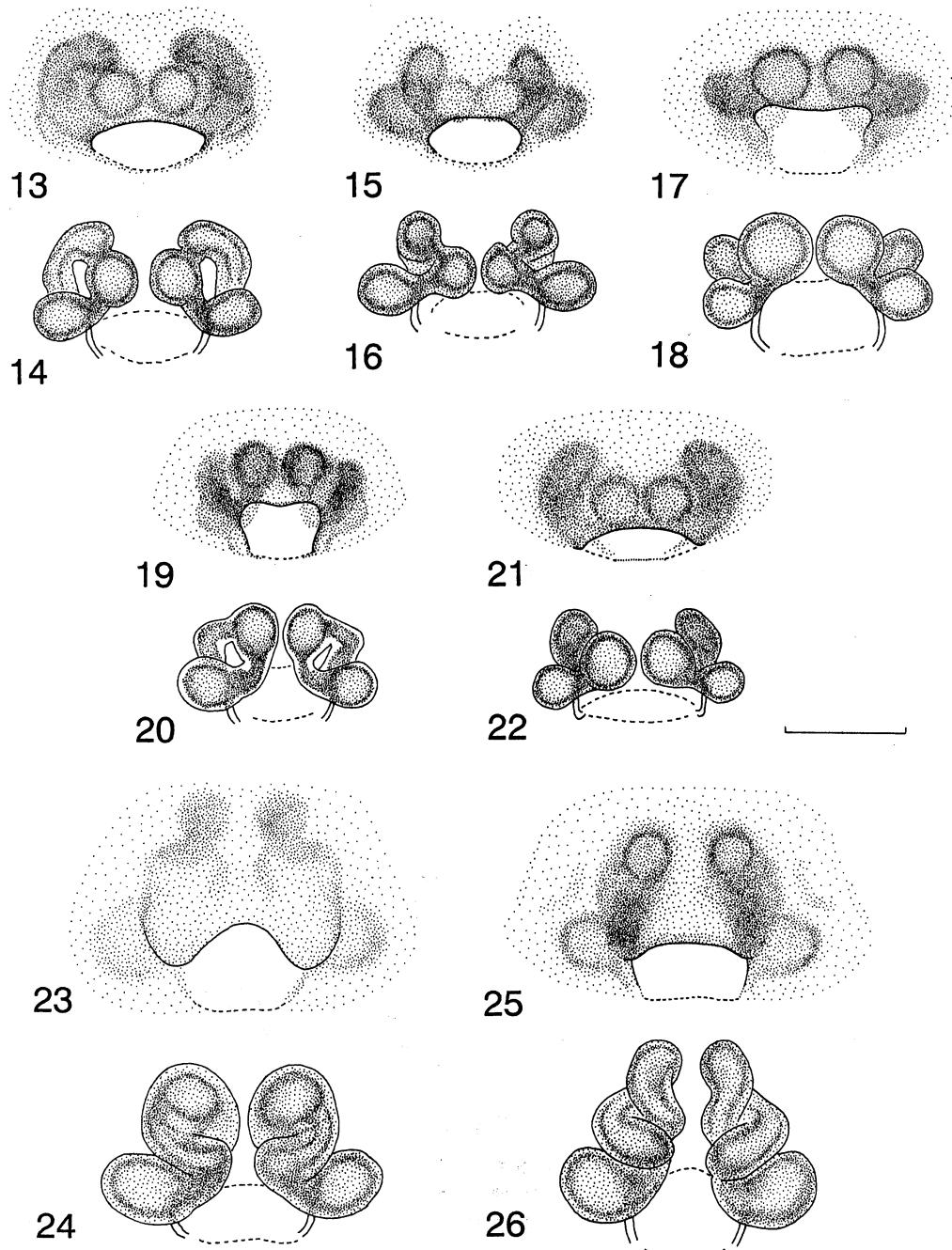
**Distribution.** Northeastern part of Hiroshima Pref., eastern part of Shimane Pref. and western part of Okayama Pref., western Honshu, Japan (Fig. 1).

**Remarks.** Males of this species are easy distinguishable from other species of the group by unique patellar apophysis of palp. Female genitalia of this species resemble that of *C. tsurugi*.

*Cybaeus kunisakiensis* n. sp.  
[Japanese name: Kunisaki-hime-namihagumo]  
(Figs. 10, 21-22, 35-36, 41)

**Diagnosis.** Distinguishable from other species of this group by details of the genital organs.

**Description.** Male (holotype). Measurements (in mm). Body length 4.10; carapace length 2.04, width 1.38, head region width 0.81; abdomen length 2.06, width 1.78; sternum length 1.03, width 0.92. Length of legs (femur / patella / tibia / metatarsus / tarsus; total): Leg I: 1.61/0.62/1.40/1.35/0.89; 5.87. Leg II: 1.51/0.61/1.18/1.16/0.82; 5.28. Leg III: 1.34/0.53/0.96/1.16/0.72; 4.71. Leg IV: 1.58/0.61/1.38/1.69/



**Figs. 13–26.** Female genitalia: 13–14 *Cybaeus miyosii* (Mt. Saragamine, Ehime Pref.); 15–16 *C. miyosii* (Donari-chô, Tokushima Pref.); 17–18 *C. okafujii* (Jakuchi-kyô Gorge, Yamaguchi Pref.); 19–20 *C. kumaensis* (Izumi-mura, Kumamoto Pref.); 21–22 *C. kunisakiensis* n. sp. (paratype); 23–24 *C. hibaensis* (paratype); 25–26 *C. tsurugi* n. sp. (paratype). — 13, 15, 17, 19, 21, 23, 25 epigynum, ventral view; 14, 16, 18, 20, 22, 24, 26 internal structure, dorsal view. (Scale: 0.2 mm).

0.87; 6.13.

Anterior eye row slightly procurved as seen from front, posterior eye row almost straight as seen from above. Diameter of eyes: anterior median eyes < posterior median eyes < posterior lateral eyes < anterior lateral eyes; anterior median eyes 1/3 or less to anterior lateral eyes. Chelicera, retromargin with 3 teeth and 6 denticles. Metatarsus of second leg with 4 prolateral spines. Colulus two groups of 3

setae.

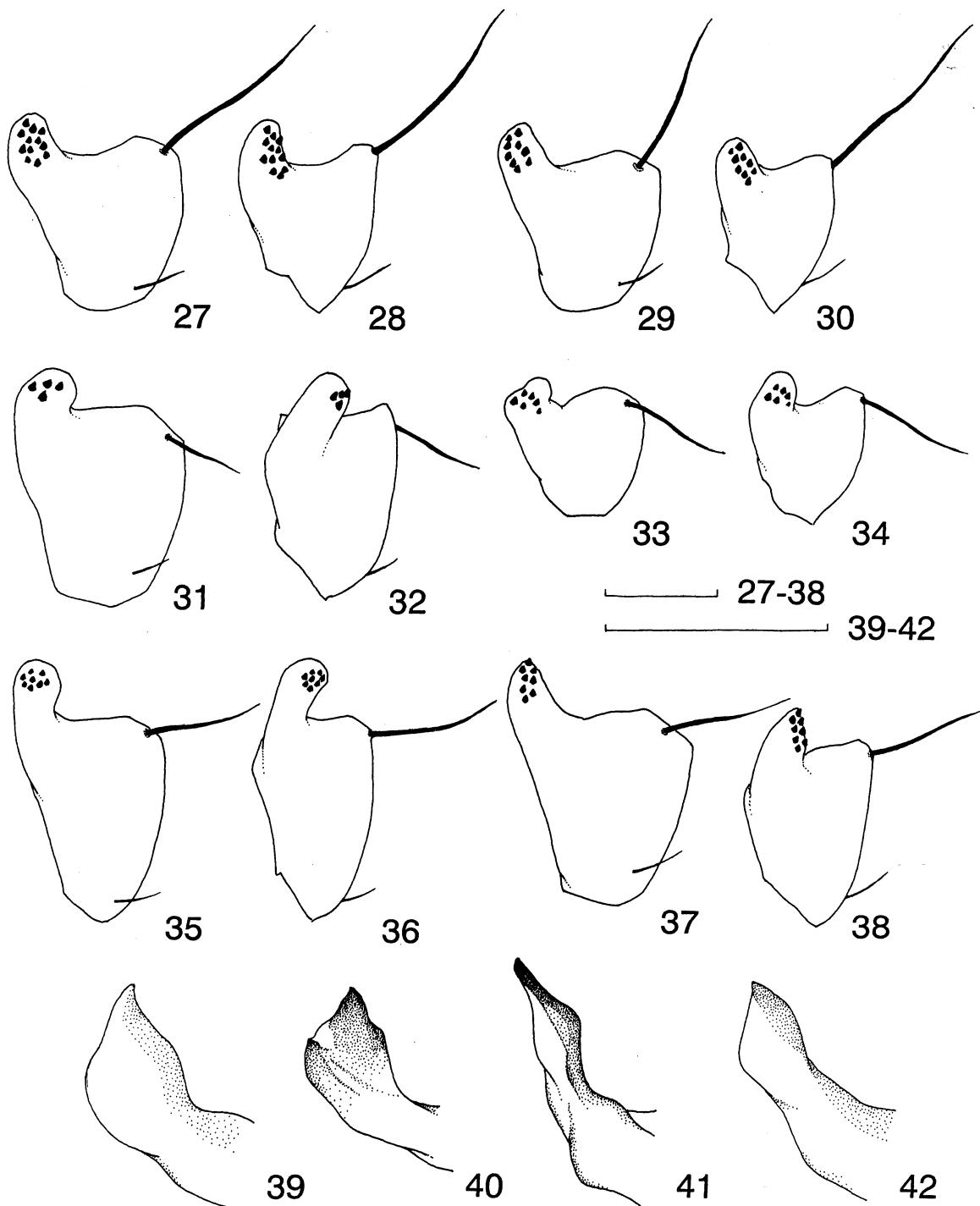
Palp (Figs. 10, 35–36, 41). Patella relatively long, retrolaterally with long and rounded apophysis, with 8 conical teeth. Apical part of conductor undulate.

Coloration. Carapace orange yellow, chelicerae, maxillae, labium and sternum reddish brown; chelicerae darker than the others. Legs yellowish brown with dark grayish annulations.

Female. Measurements (in mm; paratype). Body length; 4.25; carapace length 2.01, width 1.35, head region width 0.91; abdomen length 2.24, width 1.68; sternum length 1.02, width 0.91. Length of legs (femur / patella / tibia / metatarsus / tarsus; total): Leg I: 1.42/0.63/1.24/1.10/0.75; 5.14.

Leg II: 1.35/0.58/1.06/1.05/0.72; 4.76. Leg III: 1.17/0.54/0.82/0.95/0.62; 4.10. Leg IV: 1.49/0.58/1.22/1.41/0.72; 5.42.

Female genitalia (Figs. 21-22). Opening of epigynum narrow.



Figs. 27-42. Male palp (left): 27-28, 39 *Cybaeus miyosii* (near the type locality); 29-30 *C. miyosii* (Donari-chō, Tokushima Pref.); 31-32 *C. okafujii* (paratype); 30, 36, 40 *C. kumaensis* (Izumi-mura, Kumamoto Pref.); 33-34, 40 *C. kunisakiensis* n. sp. (holotype); 37-38, 42 *C. tsurugi* n. sp. (holotype). — 27, 29, 31, 33, 35, 37 patella, dorsolateral view; 28, 30, 32, 34, 36, 38 patella, lateral view; 39-42 apical part of the conductor. (Scale: 0.2 mm).

*Type series.* Mt. Futago-yama, Kunisaki-machi, Higashikunisaki-gun, Oita Pref., Japan: holotype ( $\delta$ ); paratypes (1♂1♀), 9-X-1993, Y. Ihara leg.

*Other specimens examined.* OITA PREF. Ōita-gun, Shōnai-chō, Kumamureyama, 1♀, 11-X-1993, YI. Kusu-gun, Kokonoe-machi, Kyūsui-kei, 2♀, 30-XI-1993, NT. Simoge-gun, Yabakei-machi, Shin-yabakei, Kin-un-kyō, 1♀, 1-XII-1993, NT. Usa-gun, Ajimu-machi, Suzuki, 1♂, 11-X-1993, YI.

*Variation.* No prominent variation was found in the morphology among populations, probably due partly to its narrow range of distribution.

*Distribution.* Oita Prefecture, Northeastern Kyushu, Japan (Fig. 1).

*Remarks.* Male of this species is easily distinguishable from other species belonging to this group by shape of patellar apophysis of palp. Epyginum of this species closely resembles that of *C. miyosii*.

#### *Cybaeus tsurugi* n. sp.

[Japanese name: Tsurugi-hime-namihagumo]

(Figs. 11, 25–26, 37–38, 42, 51–52, 55)

*Diagnosis.* Distinguishable from other species of the *miyosii*-group by details of the genital organs.

*Description.* Male (holotype). Measurements (in mm). Body length 4.00; carapace length 2.35, width 1.64, head region width 0.94; abdomen length 2.04, width 1.34; sternum length 1.04, width 0.99. Length of legs (femur/patella/tibia/metatarsus/tarsus; total): Leg I: 1.70/0.68/1.53/1.39/0.98; 6.28. Leg II: 1.60/0.60/1.32/1.33/0.90; 5.75. Leg III: 1.45/0.58/1.04/1.32/0.77; 5.16. Leg IV: 1.74/0.63/1.53/1.72/1.00; 6.62. Ocular area: length 0.62, width 0.30.

Anterior eye row slightly procurved as seen from front, posterior eye row almost straight as seen from above. Diameter of eyes: anterior median eyes < posterior median eyes < posterior lateral eyes < anterior lateral eyes; anterior

median eyes 1/3 or less to anterior lateral eyes. Chelicera, retromargin with 3 teeth and 4 denticles. Metatarsus of second leg with 2 prolateral spines. Colulus two groups of 3 or 4 setae.

*Palp* (Figs. 11, 37–38, 42, 51–52, 55). Patella with triangle apophysis, the apex pointed, with 8 conical teeth. Tibia relatively long, slightly shorter than patella.

*Coloration.* Carapace bright yellowish brown, head region darker and faint radial bands on the thorax. Chelicerae, maxillae, labium and sternum yellowish brown; chelicerae darker than the others. Legs bright yellowish brown without annulations. Abdomen dark grayish yellow, dorsally with pale yellow chevron pattern.

*Female.* Measurements (in mm; paratype). Body length; 5.00; carapace length 2.38, width 1.71, head region width 1.08; abdomen length 2.85, width 2.02; sternum length 1.17, width 1.10. Length of legs (femur / patella / tibia / metatarsus / tarsus; total): Leg I: 2.00/0.78/1.76/1.60/0.89; 7.03. Leg II: 1.90/0.75/1.58/1.56/0.87; 6.66. Leg III: 1.66/0.69/1.18/1.48/0.84; 5.85. Leg IV: 1.97/0.69/1.64/1.93/0.92; 7.15.

*Genitalia* (Figs. 25–26). Epigynal plate slightly swell. Opening of epigynum rectangle.

*Type series.* Kawakami, Koyadaira-son, Mima-gun, Tokushima Pref., Japan: holotype ( $\delta$ ); paratypes (1♂1♀), 21-IV-1994, Y. Ihara leg.

*Other specimens examined.* TOKUSHIMA PREF. Myōzai-gun, Kamiyama-chō: Fudono, 6♀, 1-V-1990, YI; Jinryō, Nematani, 7♀, 30-IV-1990, YI. Mima-gun, Sadami tsu-chō, Sarukai, 2♀, 25-V-1992, YI. Ichiu-son, Kuwadaira; 4♀, 26-IV-1992, YI; 1♀, 22-IV-1994, YI; 1♀, 20-VII-1996; YI. Anabuki-chō, Kuchiyama, 3♀, 21-IV-1994, YI. Koyadaira-son, Minokoshi, 2♀, 1-V-1990, YI. Miyoshi-gun: Yamashiro-chō, Tsuya, 1♀, 2-V-1990, YI; Mikamo-

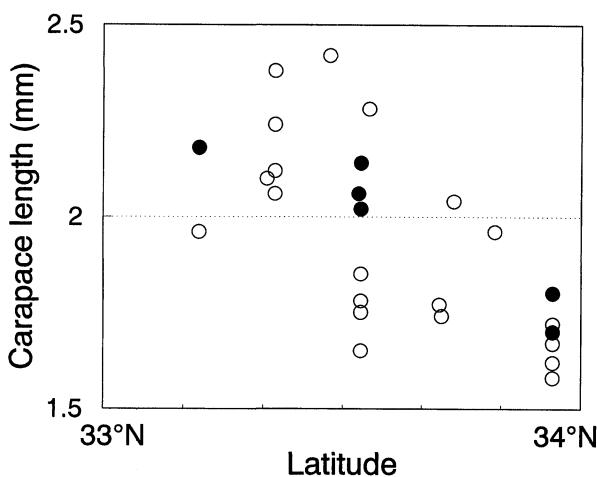


Fig. 43. Latitudinal variation in carapace length as the body size of *Cybaeus miyosii* in western part of Ehime Prefecture. Solid circle: male, Open circle: female.

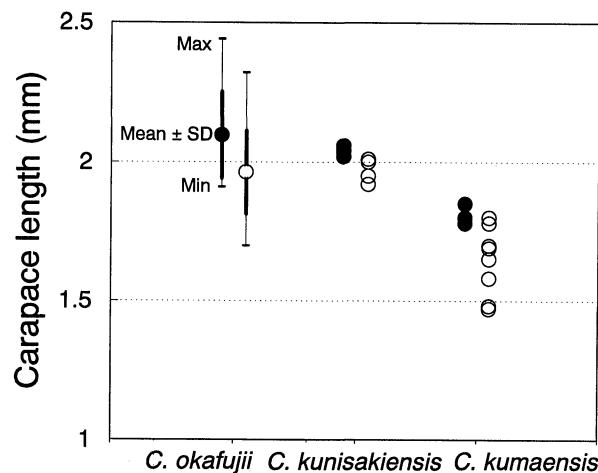
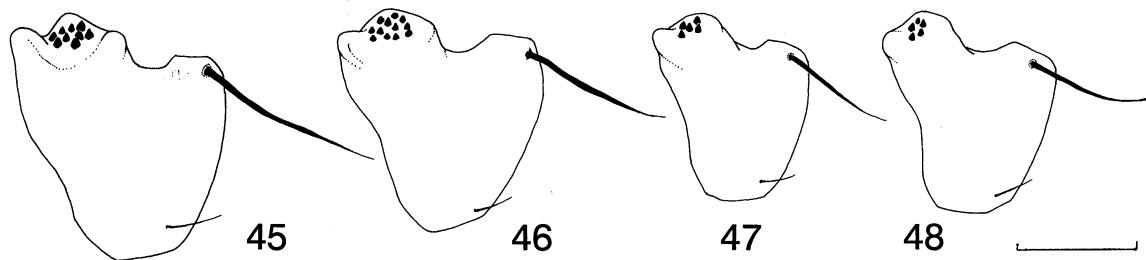
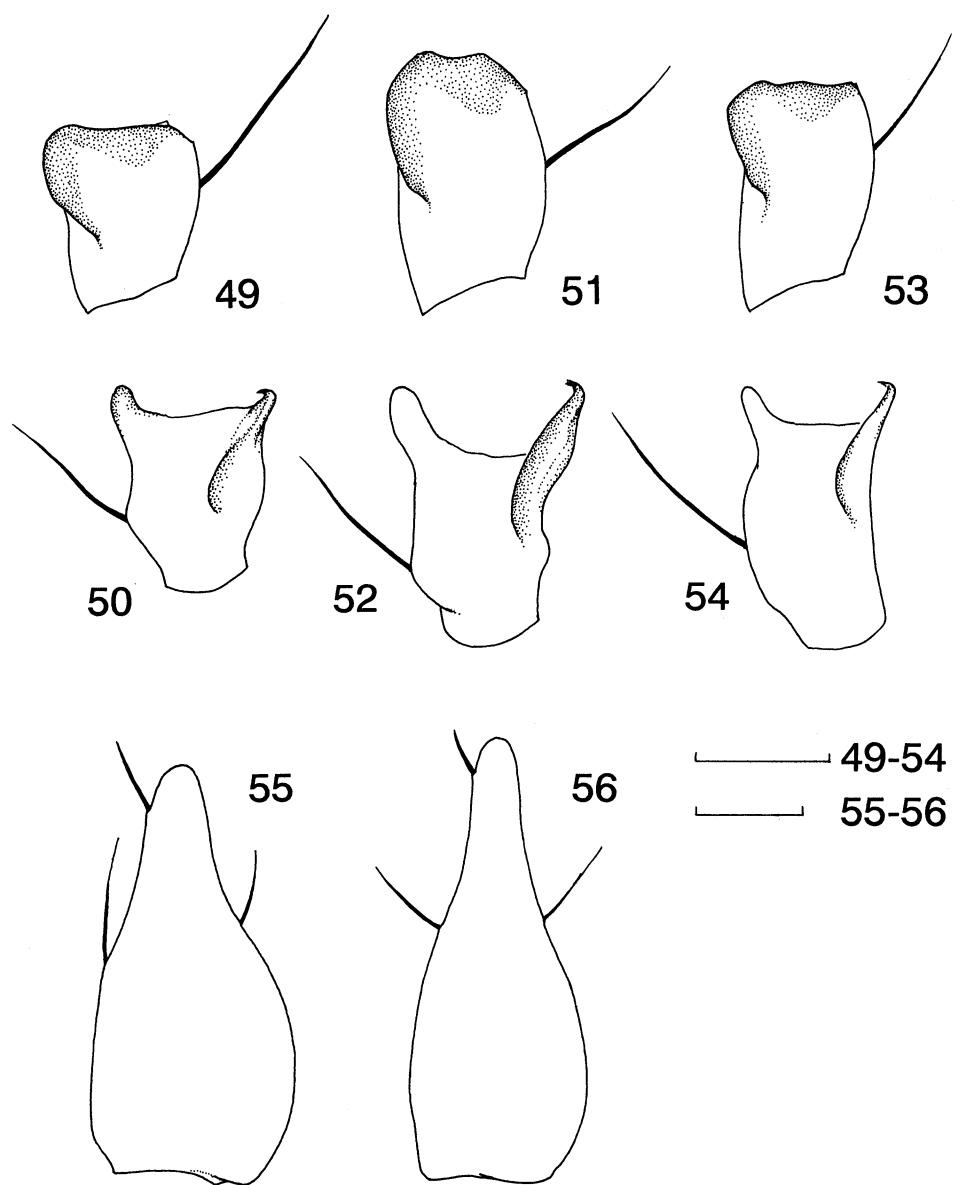


Fig. 44. Carapace length as the body size among three species *Cybaeus okafujii*, *C. kunisakiensis* n. sp. and *C. kumaensis*. Measurements for *C. okafujii* were made on arbitrarily selected 20 males and 20 females. Solid circle: male, Open circle: female.



Figs. 45–48. Variation of male palpal patella (left) of *Cybaeus hibaensis*: 45 Holotype, Mt. Tate-eboshi, Saijo-chō, Hiroshima Prefecture; 46 Higashi-izumo-chō, Shimane Prefecture; 47 Mt. Yubitani, Takano-chō, Hiroshima Prefecture; 48 Ja-no-ana Cave, Yoshii-chō, Okayama Prefecture. (Scale: 0.2 mm).



Figs. 49–56. Male palp (left): 49–50 *Cybaeus miyosii* (near the type locality); 51–52, 55 *C. tsurugi* n. sp. (holotype); 53–54, 56 *C. sp.* (Tosa-chō, Kochi Pref.). — 49, 51, 53 tibia, retrolateral view; 50, 52, 54 tibia, ventral view; 55–56 cymbium dorsal view. (Scale: 0.2 mm).

chō, Nishishō, 4♀, 25-IV-1992, YI. KOCHI PREF. Nagaoka-gun, Ōtoyo-chō. Mt. Kajigamori: 6♀, 2-V-1990, YI; 1♂, 22-IV-1994, YI.

**Variation.** No prominent variation was found in the morphology of female genitalia both within and among populations. Male specimens are only collected from the type locality.

**Distribution.** Northern part of Tokushima Prefecture and northeastern part of Kochi Prefecture, Eastern Shikoku, Japan (Fig. 1).

**Remarks.** Male palp of this species resembles that of *C. miyosii*. Furthermore, cautions are required for identification, since closely resemble species whose specific name unsettled is known in Shikoku (Figs. 12, 53–54, 56). In particular, their patellar apophysis which is principal diagnostic character of this group are closely resembled. However, shape of tibia and cymbium of male palp of these species are distinct each others (cf. Figs. 49–51, 55 with 53–54, 56).

#### Acknowledgments

I wish to express my hearty thanks to Dr. Nobuo Tsurusaki, Tottori University, for his long-term direction, reading manuscript of the present paper and offering specimens, and to the late Dr. Takeo Yaginuma for offering his personal collection of specimens of the genus *Cybaeus*. I also thank Mr. Koichi Nojima, Osaka, and Ms.

Megumi Ihara, Hiroshima, for offering specimens and helping field collecting. Thanks are also due to Dr. Takahide Kamura, Otemon Gakuin University, for loaning the type specimens of *Cybaeus okafujii* and *C. miyosii*.

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Received November 21, 2003 / Accepted December 8, 2003

*Staręga* = *O. hemseni* Roewer, *Egaenus rugosus* Schenkel = *Scleropilio insolens* (Simon) (ウデザトウムシ). (和訳：編集委員会)

### ヒメナミハグモ種群（ナミハグモ科）の地理的分化および2新種の記載 (pp. 103-112)

井原 庸 (〒730-8631 広島市中区広瀬北町9-1, 広島県環境保健協会)

ナミハグモ科の *Cybaeus miyosii* Yaginuma 1941 ヒメナミハグモ, *C. okafujii* Yaginuma 1963 アキヨシナミハグモ, *C. kumaensis* Irie & Ono 2001 クマナミハグモ, *C. hibaensis* Ihara 1994 ヒバナミハグモの4既知種と, *C. kunisakiensis* クニサキヒメナミハグモ（新称）, *C. tsurugi* ツルギヒメナミハグモ（新称）の2新種をヒメナミハグモ種群として記載した。これらの6種は、同一地域に生息するナミハグモ属のなかでは、小型から中型で体色の淡い種である。ヒメナミハグモ種群は、中国地方、四国、九州の西日本に分布する。それぞれの種は、種群の分布域のなかで地理的に分かれて分布している。外部形態がたいへんよく似ていることと、側所的な分布をすることから、ヒメナミハグモ種群を上種とみなすことができる。

### 南アフリカ共和国、レソト王国のコナダニモドキ属（ササラダニ類：コナダニモドキ科）(pp. 113-126)

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南アフリカ共和国、レソト王国からは今までコナダニモドキ科の報告はなく、このたびブルームフォンテイン (Bloemfontein) 南アフリカ国立博物館所蔵標本の南アフリカ共和国、レソト王国各地から採集されたコナダニモドキ属 (*Malaconothrus*) を調査し、*Malaconothrus minimus*, *Malaconothrus longidorsus*, *Malaconothrus engelbrechti*, *Malaconothrus stigmatus*

の4種を新種として記載し、ニュージーランドから報告されている *Malaconothrus indifferens* Hammer 1966 を南アフリカ共和国の標本を基に再記載した。*Malaconothrus minimus* sp. nov. は Hammer (1958) がアルゼンチンから報告している *M. angulatus* に盾型の胴体部、4対の性扉毛をもつ点において似ているもの的小型である、桁毛が長い、胴背毛の  $d_2$  が胴体部の縁近くに位置している、胴背毛の  $(d_1-d_1)$ ,  $(e_1-e_1)$  と  $(e_1-h_1)$  の間隔が長い、 $ip$  が胴体部の縁近くにある等の点において相違している。*M. longidorsus* sp. nov. は Hammer (1958) がアルゼンチンから報告している *M. atuelanus* に胴体部の隆起、4対の性扉毛をもつ点において似ているものの、横桁が連結していない、非常に細かい顆粒の皮膜で覆われている、 $ia$ ,  $ip$  が大きく、逆W型の隆起がある点において相違しており新種とした。*Malaconothrus engelbrechti* sp. nov. は 5対の性扉毛、胴体部の両側にクチクラの発達していない部分がある点で Yamamoto (1998) が中国から報告した *M. marginatus* に似ているものの、胴体部に明瞭でないが隆起のある点、胴背毛の  $h_1$  が短い。第1脚底や桁の形状が丸まっている点において異なっている。*M. stigmatus* sp. nov. はブラシ状の吻毛と、同じ長さの桁間毛と桁間外毛が大きな特徴であり、これらの特徴をもつ種は、Balogh (1962) がマダガスカルから報告している *M. subsrasus*, Hammer (1966) がニュージーランドから報告した *M. keriensis* と、Mahunka (1982) がエチオピアから報告している *M. ensifer* に似ているものの、胴体部の周辺近くに小さい網目状の皮膜が数カ所ある点において異なっており新種とした。*M. indifferens* は Hammer (1966) がニュージーランドから報告したものであるが、この度出現した種は、胴背毛  $(d_1-d_1)$  の間隔が短い、 $h_2$  が長い、 $ps_2$  と  $ps_3$  の間隔が短い等の点において相違しているものの種を異にするほどの特徴でなく、*M. indifferens* と同定し、再記載した。

## 書評 Book Reviews

クモの巣と網の不思議 多様な網とクモの面白い生活  
池田博明（編）池田博明・新海 明・谷川明男（共著）(2003)  
文葉社（東京）183 pp.  
ISBN 4-902254-02-6 2,400 円

最近、比較的マイナーな分類群であるクモ類の本が続々と出版されている。なぜだろうか。社会的な追い風が吹いているとは思えない。たぶん国内外を問わず、クモ研究のレベルが以前よりも上がってきている、さまざまな知見を世に出す時期に来ているからだと思う。この本を読めば、その一端を垣間見ることができるに違いない。

この本の位置づけ、あるいは特色について考えてみよう。著者らも巻末で述べているように、本書は10年以上前に出版された「クモのはなし」（梅谷、加藤編）と内容的にかなり近い。



内容は大幅にバージョンアップされているが、意外に知られていなかったクモの習性や、最近の面白いトピックを中心に話が構成されている点が類似している。個々の話題を読んでみると、著者によって観点が違っているのがわかる。池田氏と谷川氏は基本的に解説調であり、新海氏は謎解き調である。解説調の話では、クモの生態や網の性質全